

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 6, 10, 14 and 15 are pending in the application, each of which is an independent claim. The specification is sought to be amended to correct a bibliographic citation. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***I. Rejection under 35 U.S.C. § 112, first paragraph***

Claims 6, 10, 14 and 15 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time of filing. *See* Office Action, page 2, lines 15, through page 3, line 6. Applicants respectfully traverse the rejection.

Support for the term *arable* can be found, *inter alia*, at page 2, lines 9-11, in the application as filed. According to the present invention "[g]rowing plants, including crops, on contaminated soil to extract contaminants is referred to as phytoextraction. This method is particularly effective in *arable contaminated soils* because it causes little disruption or dispersal, while preserving soil fertility and landscapes." Application as filed, page 2, lines 9-11 (emphasis added). Because support for the term *arable* and the

concept of cultivating plants in arable contaminated soils are found in the specification as filed, Applicants submit the rejection is improper and request that it be withdrawn.

***II. Rejection under 35 U.S.C. § 112, second paragraph***

Claims 6 and 10 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to point out and distinctly claim the subject matter which Applicants regard as their invention. *See* Office Action, page 3, lines 7-18. Applicants respectfully traverse the rejection.

Soils can be both arable and contaminated. The term arable refers to soil fit for cultivating crops. Phytoextraction relates to the process by which plants or crops are grown in contaminated soil to remove contaminants from the soil. Soils containing contaminants such as zinc and cadmium can be fit for cultivating crops, *i.e.* be arable, for example, when the crops remove zinc and cadmium from the soil through phytoextraction. A field study disclosed in the application demonstrates *T. caerulescens* phytoextracting contaminants from a field contaminated by zinc and cadmium. *See* page 9, lines 1-12 of the application as filed. A rock quarry, for example, would generally not be considered arable because crops are generally not cultivated in a rock quarry. Therefore, because soil can be both arable and contaminated, and the specification contains support for the concept of cultivating arable contaminated soils, Applicants submit the rejection has been overcome and request that it be withdrawn.

**III. Rejections under 35 U.S.C. §§ 102 and 103**

**A. *Brown et al. (J. Environ. Qual. 23:1151-1157 (1994) ("Brown I")***

Claims 6, 10, 14 and 15 were rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over *Brown et al., J. Environ. Qual. 23:1151-1157 (1994) ("Brown I")*. See Office Action, page 4, line 11, through page 5, line 21. Applicants respectfully traverse the rejection.

**1. Rejection under 35 U.S.C. § 102(b)**

The plants used in Brown I are of the "prayon" type. See Brown I, page 1152, 1<sup>st</sup> column, lines 27-28. The plants taught in Brown I were used as part of a field study disclosed in the specification. See page 8, line 15, through page 9, line 12 of the specification. Prayon type plants are labeled *T. caerulea* G18 in the specification ("G18"). See page 9, line 9 of the application as filed. In an amendment filed on March 16, 2004, the plants of Brown I were mistakenly referred to as G17, when in fact, they are G18. In contrast to Brown I, the claims of the present invention are directed to *T. caerulea* G15.

Genotype G18 is distinct from genotype G15. In the above referenced field study, G18 were cultivated in arable soil, under identical conditions as other genotypes, including G15. The results are shown in FIGS. 1-2 of the specification. Genotype G18 accumulated less than 300 mg/kg cadmium from arable soil, while G15 accumulated

more than 1500 mg/kg. Because this study shows that genotypes *G18* and *G15* accumulate different amounts of cadmium, it shows that the two genotypes are distinct. Because the two genotypes are distinct, Brown I does not anticipate claims 6, 10, 14 and 15. Applicants submit the rejection has been overcome and request that it be withdrawn.

**2. *Alternative rejection under 35 U.S.C. § 103(a)***

The examiner has not established a *prima facie* case of obviousness under 35 U.S.C. § 103(a). See M.P.E.P. §§ 706.02(j), 2141 (May 2004). Specifically, the examiner must demonstrate some suggestion or motivation to modify the reference, there must be reasonable expectation of success, and the reference must teach or suggest all claim limitations. *Id.* § 2141. Because the examiner has not met the required burden, Applicants submit the rejection under 35 U.S.C. § 103(a) is improper and request that it be withdrawn.

For at least the foregoing reasons, independent claim 6 and claims 10, 14 and 15, which depend therefrom are believed to be patentable and allowance of such claims is respectfully requested.

**B. *Brown et al. (Environ. Sci. Technol. 29:1581-1585 (1995) ("Brown II")***

Claims 6, 10, 14 and 15 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over Brown *et al.*, *Environ. Sci. Technol* 29:1581-1585 (1995) ("Brown II").

Office Action, page 6, line 1, through page 7, line 3. Applicants respectfully traverse the rejection.

**1.      *Rejection under 35 U.S.C. § 102(b)***

The plants used in Brown II are of the "prayon" type. *See* Brown II, page 1582, 1<sup>st</sup> column, lines 42-43. In contrast to Brown II, the claims of the present invention are directed to *T. caerulea* *G15*. In the field study disclosed in the specification, and discussed above under Brown I, prayon type plants were cultivated in arable soil, under identical conditions as other genotypes, including *G15*. The Prayon type plants are labeled *G18*. *See* specification, page 9, line 9. As discussed above, genotype *G18* accumulated different amounts of cadmium than *G15*, which demonstrates the two genotypes are distinct. Because the two genotypes are distinct, Brown II does not anticipate claims 6, 10, 14 and 15. Applicants submit the rejection has been overcome and request that it be withdrawn.

**2.      *Alternative rejection under 35 U.S.C. § 103(a)***

The examiner has not established a *prima facie* case of obviousness under 35 U.S.C. § 103(a). *See* M.P.E.P. §§ 706.02(j), 2141 (May 2004). Because the examiner has not met the required burden, Applicants submit the rejection under 35 U.S.C. § 103(a) is improper and request that it be withdrawn.

For at least the foregoing reasons, independent claim 6 and claims 10, 14 and 15, which depend therefrom are believed to be patentable and allowance of such claims is respectfully requested.

**C. *Brown et al. (Soil Sci. Soc. Am. J. 59:125-133 (1995) ("Brown III")***

Claims 6, 10, 14 and 15 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over Brown *et al.*, *Soil Sci. Soc. Am. J. 59:125-133 (1995) ("Brown III")*. See Office Action, page 7, line 4, through page 8, line 11. Applicants respectfully traverse the rejection.

**1. *Rejection under 35 U.S.C. § 102(b)***

The plants used in Brown III are of the "prayon" type. See Brown III, page 126, 1<sup>st</sup> column, lines 34-36. In contrast to Brown I, the claims of the present invention are directed to *T. caerulea* G15. In the field study disclosed in the specification, and discussed above, prayon type plants were cultivated in arable soil, under identical conditions as other genotypes, including G15. As discussed above, genotype G18 accumulated different amounts of cadmium than G15, which demonstrates the two genotypes are distinct. Because the two genotypes are distinct, Brown II does not anticipate claims 6, 10, 14 and 15. Applicants submit the rejection has been overcome and request that it be withdrawn.

**2. *Alternative rejection under 35 U.S.C. § 103(a)***

The examiner has not established a *prima facie* case of obviousness under 35 U.S.C. § 103(a). See M.P.E.P. §§ 706.02(j), 2141 (May 2004). Because the examiner has not met the required burden, Applicants submit the rejection under 35 U.S.C. § 103(a) is improper and request that it be withdrawn.

For at least the foregoing reasons, independent claim 6 and claims 10, 14 and 15, which depend therefrom are believed to be patentable and allowance of such claims is respectfully requested.

***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, reading "Christopher J. Walsh". The signature is written in a cursive, flowing style.

Christopher J. Walsh  
Agent for Applicants  
Registration No. 55,709

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1100 New York Avenue, N.W.  
Washington, D.C. 20005-3934  
(202) 371-2600

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